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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,598	05/18/2006	Andrew David Laver Humphris	P2587US	1836

55694 7590 07/05/2007

DRINKER BIDDLE & REATH (DC)
1500 K STREET, N.W.
SUITE 1100
WASHINGTON, DC 20005-1209

EXAMINER	
RAEVIS, ROBERT R	

ART UNIT	PAPER NUMBER
2856	

MAIL DATE	DELIVERY MODE
07/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,598	HUMPHRIS ET AL.	
	Examiner	Art Unit	
	Robert R. Raevis	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) *3,4,22,23,32 and 33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5-21 and 24-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election of Figure 7(Atomic Force Microscope) is acknowledged.

Claims 1-15,22,23,25-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 1,6, "atomic force microscope or for nanolithography" are not alternatives. Applicant has elected the microscope. Suggest deletion of "or for nanolithography".

As to claims 1,6, "for atomic force microscope or for nanolithography" is indefinite, as the two are not equivalents.

As to claim 22, how is this claim directed to elected Figure 7? Isn't the "capillary neck" related to non-elected Figure 2?

As to claim 25, how is this claim directed to elected Figure 7? Isn't the "liquid" related to non-elected Figure 6?

As to claim 26, "the force sensing element" lacks antecedent basis.

Claims 16,28 are rejected under 35 U.S.C. 102(e) as being anticipated by Hough et al.

As to claim 16, Hough et al teach (Figure 2) an AFM including: driving means 20,22,24 to provide relative scanning motion between a probe 12,14 and sample 18 surface 16, and capable of bringing the sample and probe into close proximity; a probe detection mechanism 26,28 to measure deflection; and force generating means 24

arranged such that a force is applied to the sample, the force being directed so as to urge the sample towards the probe.

As to claim 28, note (Para 8) piezo element 30 that provides for oscillation.

Claims 24,25,26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hough et al.

As to claim 24, the probe has a Q, and not all probes have identical Qs. It would have been obvious to employ the system with probes having different Q's as the reference is silent as to whether the system would operate with only a probe having a maximum Q.

As to claim 25, it is known to immerse probes and sample in liquid to provide for testing.

As to claim 26, note the particle 32 that will affect damping.

Claims 1,4,5,6,7,8,9,13,14,29,30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawabe et al, in view of either Hough et al or Minne.

Shirakawabe et al teach (Para 34; Figure 1) an AFM including: probe with force sensing member 11 connected to a tip 11a, the tip including a coating on the tip 11a that is biased via magnetic field to induce sample/tip contact that is indicated by current flow between the sample and tip. When contact is initially made, the probe ceases to deflect, but the magnetic field results in a greater force between the tip and sample

beyond that which induces initial contact 11, naturally employs a level of force that is barely greater than that necessary for that initial contact.

Shirakawabe does not describe tip dimensions.

As to claims 1,4,5,6,29, either Hough et al (Para 44) of Minne (col. 2, lines 40-50) teach use of tips smaller than 100 nm to allow for accurate measuring in AFMs, suggestive of such dimensions in Shirakawabe.

As to claims 7,8, the probe has a Q, and not all probes have identical Qs. It would have been obvious to employ the system with probes having different Q's as the reference is silent as to whether the system would operate with only a probe having a maximum Q.

As to claims 9,13,30, the cantilever inherently dampens, and is a dampening element, and also has a coating on it.

As to claim 14, note driving means 13 and detector 15.

Claims 16,17,18 are rejected under 35 U.S.C. 102(b) as being anticipated by Shirakawabe et al.

As to claim 16, Shirakawabe et al teach a microscope, including: driving means 13; and probe detection mechanism 15; wherein a magnetic force between the sample and tip exists such that a force is applied to the probe to urge the probe and sample together, the force due to magnetic material coated on the tip 11a. The claim is limited to the structure defined in the body of the claim.

As to claims 17,18, the magnetic force must be just greater than the amount absolutely necessary for contact to both assure contact and permit current flow.

Claims 19,24,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawabe et al.

As to claim 19, the constant claimed is in the range commonly employed in microscopes.

As to claim 24, the probe has a Q, and not all probes have identical Qs. It would have been obvious to employ the system with probes having different Q's as the reference is silent as to whether the system would operate with only a probe having a maximum Q.

As to claim 25, it is known to immerse probes and sample in liquid to provide for testing.

As to claim 26, cantilevers inherently have damping.

Claims 1,4,5,6,14,15,16,18,21,28,29 are rejected under 35 U.S.C. 102(b) as being anticipated by Hong et al.

As to claims 1,6,16,29, Hong et al teach (Figure 1a,1b) an AFM including: probe having a tip 132 with 50 nm radius (col. 11, lines 14-18), the probe responsive to an electrostatic force (ABSTRACT), which force does not effect beam deflection after contact is made.

As to claims 4,5,16, note voltage source 122,118, and conductive portion 164.

As to claims 14,16,29, note the driving means 152, detector 138, in Figure 1a.

As to claims 15,28, Hong employs an oscillating mode.

As to claims 16,17,18,21,29, note the drive scanner 110 and detector 138.

Claims 7,8,13,19,24,25,26,30,31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al.

As to claims 7,8,13,24, the probe has a Q, and not all probes have identical Qs. It would have been obvious to employ the system with probes having different Q's as the reference is silent as to whether the system would operate with only a probe having a maximum Q.

As to claim 19, the constant claimed is in the range commonly employed in microscopes.

As to claim 25, it is known to immerse probes and sample in liquid to provide for testing.

As to claims 26,30, cantilevers inherently have damping. As to claims 31, Hong employs an oscillating mode.

Claims 9,10,11,12,27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hong et al as applied against claims 8,26, and further in view of Erie et al.

As to claims 9,10,11,12,27, Erie teaches (col. 6, lines 42-62) use of polymeric coatings for cantilevers requiring reflective surfaces for proper measuring with optics.

Use of "polymers" is suggestive of trying any known polymer, as Erie is silent as to any specific polymers.

Comments to specification that do not affect present claims:

As to p. 21, how is the relation on line 3 correct? How are Fdirect and kx two different forces? Note that the second force Fdirect acts to "accelerate the probe towards the sample" (page 20, lines 23-24), which acceleration certainly must induce bending, as it is the tip 11a that is pulled towards the plate 12 in Figure 7 during the acceleration. Page 20 seems to suggest that there is overlap between the two forces, but the relation on page 21 (line 3) seems to suggest that they are independent forces. This is not consistent. Possibly, the Fdirect force is improperly defined (as in "Fdirect acting to accelerate the probe towards the sample"), and Fdirect is really the force applied between the sample and tip that is in addition to the force (i.e. kx) created by the cantilever bending

On p. 21, lines 8-14; how can Fdirect be in addition to the kx force? After all, doesn't the electrostatic force induce bending, which is exactly what the kx force it? Isn't the Fdirect force a segment (i.e. portion) of the kx force? Doesn't the Fdirect induce bending?

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lindsay et al teach use of a magnet layer 46 (Figure 9) on a cantilever to drive the probe into a sample surface, necessarily resulting in a force independent of beam deflection when contacting (Figure 14) is made. While this reference teaches several of the above claims, the reference may be seen to be no more relavant than those references applied.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert R. Raevis whose telephone number is 571-272-2204. The examiner can normally be reached on Monday to Friday from 5:30am to 3pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams, can be reached on 571-272-2204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert

RAEVIS